Scenario ID	213
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Reviewers	Mike Lamm, Mike Lamont, Elliott McCrory, Suzanne Panacek, Jean Slaughter
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Goal	Observe first beam in the LHC from LHC@FNAL
Level	High level
Actors	LARP collaborators at Fermilab, LARP collaborators based at CERN, CERN CCC personnel and management
Trigger	The LHC is completely cold, all necessary hardware testing is complete, injection has been re-established, all necessary approvals have been obtained, and CERN management has granted permission to begin circulating beam operation.
Narrative	At the Wednesday morning meeting it is agreed that beam commissioning will begin promptly at 0600 CERN time the next morning. LHCOP/LARP collaborators at CERN inform LARP management in the US, namely Steve, the LARP Commissioning Coordinator, that first attempts at injecting beam into LHC will commence the next day LHC@FNAL shall have access to information/decisions made in daily scheduling meetings Email is sent to all interested parties in the US that LHC@FNAL center will be open and manned beginning 2 hours the scheduled start time (1100 CDT). A shift schedule has been determined beforehand to man LHC@FNAL around the clock as needed. Alan and Joanne are scheduled to be the first on-shift personnel at Fermilab. LHC@FNAL shall be manned by assigned personnel as conditions require and the schedule shall be posted at both CERN and LHC@FNAL

	On the morning of day 1 Alan and Joanne initiate communication with the CCC via the on-demand video and audio link. Jacques (CERN operator) and George (LARP person) are on shift at CERN and have been specifically directed to man the LARP console and provide communication to LHC@FNAL. On demand video and audio links shall be available between the CERN CCC and LHC@FNAL At the direction of the Commissioning Coordinator/EIC in the CCC, LHC@FNAL is specifically charged with monitoring inner quad triplet thermometry and to act as a second set of eyes monitoring 'real time' orbit displays. Alan and Joanne are to inform the EIC through Jacques and George if any anomalous behavior is noted. As they begin their shift, Alan and Joanne call up the appropriate displays and set the large fixed displays to show orbit data and CERN status channel. The glass partition between the experimental and accelerator sections of LHC@FNAL are closed. Steve, who is also in charge of crowd control will act as liaison should Joanne and Alan require assistance from the observers present. Since monitoring of thermometry is a specific assignment, Fermilab experts familiar with the inner quad triplets are specifically asked to sit in with Alan and Joanne. LHC@FNAL shall be equipped with consoles similar/identical to the CERN CCC Via Jacques and George, and the open communication link, it is learned that beam has beam transported down TI8 and injection settings are being verified. Injection kickers will be turned on for the next beam cycle. Injection is enabled and after 2 hours of threading, beam is visible on the BPM's around the LHC to the end of Octant 5. After verifying that the orbit corrections match simulations while threading the beam this far, Automatic orbit correction is enabled to complete one turn. Beam is immediately visible on the BPM's around the LHC to the end of Octant 2, but abruptly disappears at the beginning of sector 1. Alan, Joanne, and Fritz (the magnet expert) note that magnet temperatures look normal and are similarly puzzled by the loss of beam signal. Since there is no BPM signal in any of Sector 1 it is unclear whether the problem is beam or instrumentation, but all indications are that the hardware is functioning correctly.

	A Quench occurs; Jacques and George report that the quench occurred due to a cryogenic instability and several hours of recovery time, at least 8, will be required prior to beam operation resuming. Shifters at Fermilab are dismissed by Steve, the US Commissioning Coordinator, and the next crew is apprised that they will be contacted when to report since recovery time is unclear and an access may follow. Before leaving, Joanne, who has also supplied some of the application code for the BPM/orbit correction, and is therefore familiar with it, scans some of the orbit correction data in cooperation with George and Jacques. They jointly discern that the setting for a vertical orbit corrector early in Sector 1 is set to an unusually large value compared to other vertical settings. It is also discovered that a BPM scale factor is reversed. LHC@FNAL shall have read-only access to all accelerator data Jorg, the orbit expert at CERN, who has been present all along, runs a simulation and it is determined that the BPM input to the electronics in the tunnel is likely reversed. Joanne modifies the code under Jorg's direction and a second simulation confirms a more realistic setting for the corrector. With the EIC's permission, this change is sent out. Since sector 1 is still cold the change in current is verified. This is documented in the CCC log. LHC@FNAL tools shall include software for applications development The second crew at LHC@FNAL arrives to learn that recovery will actually take 12 hours through their on-line briefing with their CCC counterparts. They contact Steve who dismisses them until 1 hour before beam time. Charles, who is manning the LHC@FNAL console in the CCC, takes down the cell phone number of one of the shifters in case there is a change in schedule. LHC@FNAL is unmanned. LHC@FNAL shall have a display of who is on shift at CCC and LHC@FNAL LHC@FNAL personnel will be available for all scheduled shifts

	and the CCC will be informed of alternate communication means The LHC@FNAL on-shift personnel, Paul and Mike, arrive and are joined by a dozen observers. Steve offers to make espresso for anyone who wishes some and has also supplied pastries. Space for LHC@FNAL shall include a social and kitchen areas Beam operation resumes on schedule and beam circulates in the LHC for 2 seconds before being intentionally dumped. It is apparent to all in LHC@FNAL that circulating beam has been achieved. Steve reminds all that this is privileged information. The study plan continues without incident for the remainder of the day. LHC@FNAL personnel shall be bound by agreements with CERN regarding dissemination of accelerator performance information The EIC/Commissioning Coordinator announces that the CERN DG has scheduled a press conference for 3 hours from now and that there will be streaming video available worldwide of this conference. It is suggested that email be sent to LARP collaborators informing them of this.
Exceptions	
Comments	